

PROCESS FOR A MONOLITHICALLY-INTEGRATED MICROMACHINED SENSOR AND CIRCUIT

Abstract of Disclosure

A process using integrated sensor technology in which a micromachined sensing element and signal processing circuit are combined on a single semiconductor substrate to form, for example, an infrared sensor. The process is based on modifying a CMOS process to produce an improved layered micromachined member, such as a diaphragm, after the circuit fabrication process is completed. The process generally entails forming a circuit device on a substrate by processing steps that include forming multiple dielectric layers and at least one conductive layer on the substrate. The dielectric layers comprise an oxide layer on a surface of the substrate and at least two dielectric layers that are in tension, with the conductive layer being located between the two dielectric layers. The surface of the substrate is then dry etched to form a cavity and delineate the diaphragm and a frame surrounding the diaphragm. The dry etching step terminates at the oxide layer, such that the diaphragm comprises the dielectric layers and conductive layer. A special absorber is preferably fabricated on the diaphragm to promote efficient absorption of incoming infrared radiation.